

RAPID DIAGNOSIS OF DENGUE FEVER INFECTION (SRL/6/024) E1 New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US \$	US \$	US \$	m/d	US \$	m/d	US \$	US \$	US \$	US \$	US \$
1999	1/12	20,580	0	43,700	2/0	6,900	0/28	10,080	0	0	0	81,260
2000	1/0	15,450	0	11,000	3/0	10,800	0/14	5,320	0	0	0	42,570
2001	0/0	0	0	10,000	0/0	0	0/0	0	0	0	0	10,000

First Year Approved: 1999

OBJECTIVES: To validate and adapt a rapid nuclear based diagnostic procedure using reverse transcription and polymerase chain reaction (RT-PCR) technique and transfer it to the Medical Research Institute (a national medical laboratory) for routine diagnosis.

BACKGROUND: The dengue virus infection resulted in an outbreak of dengue haemorrhagic fever (DHF) and dengue shock syndrome in Sri Lanka in 1989. The incidence of DHF is increasing, and 3,808 clinical cases and 955 serologically confirmed cases were reported up to 1995. Dengue control has been identified as a health care priority area, a presidential task force has been set up and 5th November has been declared "Dengue Day". At present, the techniques available for laboratory diagnosis of dengue virus infections at the main counterpart institution, the Medical Research Institute (MRI), include the use of a haemagglutination inhibition assay (HIA) and mosquito inoculation for virus isolation and typing. The HIA test is time consuming and not very sensitive and is thus an inappropriate technique to predict and control outbreaks of dengue fever. The Agency will assist in characterizing locally circulating strains of dengue virus and developing a rapid nuclear based method for early detection and diagnosis.

PROJECT PLAN: The activities of the project include isolating and typing dengue viruses; characterizing locally circulating strains of dengue virus; developing a rapid diagnostic procedure based on nuclear techniques; and transferring the rapid diagnostic procedure to the medical laboratory for routine testing. Three institutions will be involved in the project. The Department of Chemistry, University of Colombo is currently involved in several research projects in DNA technology, and has a well established molecular biology and biotechnology laboratory. Its personnel are experienced in handling radioisotopes and in the use of nuclear based techniques, and the rapid diagnostic method will be developed there. The MRI, now providing non-nuclear based diagnostic services, will collect serum, conduct serological tests, and isolate and type viruses. Once the rapid diagnostic test is established at the Department of Chemistry, the technique will be transferred to the MRI for routine diagnosis. The university's Department of Parasitology has been actively involved in studies on vector borne diseases and DNA probes. It will provide its expertise for the isolation of dengue viruses in wild-caught mosquitoes.

NATIONAL COMMITMENT: Existing facilities and equipment for dealing with vector borne diseases; experienced clinicians, scientific and technical staff; Government funds for maintenance and operating costs; national plan for technology transfer to the end user.

AGENCY INPUT: Expert services in RT-PCR dot blot hybridization, virus isolation and DNA sequence analysis; equipment for DNA sequence analysis, mosquito inoculation, dot blotting, centrifugation and purification, including an automated sequence analyser, a dissecting microscope, a microcentrifuge, an autoclave, a dot blot apparatus and consumables; training in molecular techniques and virus isolation and typing.

PROJECT IMPACT: Development of a rapid diagnostic test and its transfer to the Medical Research Institute for routine use will lead to better management of patients, and prediction and control of outbreaks of DHF and dengue shock syndrome.